

## **405 KAR 30:400. Revegetation.**

RELATES TO: KRS 350.600

STATUTORY AUTHORITY: KRS 224.033, 350.028, 350.050, 350.600

NECESSITY, FUNCTION, AND CONFORMITY: KRS 350.600 requires the Environmental and Public Protection Cabinet to develop administrative regulations for oil shale operations to minimize and prevent their adverse effects on the citizens and the environment of the Commonwealth. This administrative regulation sets forth requirements for revegetation of areas affected by oil shale operations, including requirements for temporary and permanent vegetative cover, use of introduced species, timing of revegetation, mulching and other soil stabilizing practices, standards for measuring revegetation success, and reporting requirements.

Section 1. General Requirements. (1) Each permittee shall establish on all affected land a diverse, effective, and permanent vegetative cover of the same seasonal variety native to the region or species that supports the approved postmining land use. For areas designated as prime farmland, the requirements of 405 KAR 30:280 shall apply.

(2) All revegetation shall be in compliance with the plans submitted under 405 KAR 30:130, as approved by the cabinet, and carried out in a manner that encourages a prompt vegetative cover and recovery of productivity levels compatible with the approved postmining land use.

(a) All disturbed land, except water areas and surface areas of roads that are approved as a part of the postmining land use, and other small incidental areas related to the fulfillment of the postmining land use plan subject to approval by the cabinet, shall be seeded or planted to achieve a permanent vegetative cover of the same seasonal variety native to the region.

(b) The vegetative cover shall be capable of stabilizing the soil surface from erosion.

(c) Vegetative cover shall be considered of the same seasonal variety when it consists of a mixture of species of equal or superior utility for the approved postmining land use, when compared with the utility of naturally occurring vegetation during each season of the year.

(d) If both the premining and postmining land uses are cropland, successful establishment of the crops normally grown will meet the requirements of paragraphs (a), (b) and (c) of this subsection.

(e) Subject to the approval of the cabinet, small incidental areas related to the fulfillment of the postmining land use may be exempted from the revegetation standards where no adverse environmental impact will occur if the exemption is granted.

Section 2. Use of Introduced Species. Introduced species may be substituted for native species only if approved by the cabinet under the following conditions:

(1) The species are compatible with the natural plant and animal species of the region;

(2) The species meet the requirements of applicable state and federal seed or introduced species statutes and are not poisonous or noxious; and

(3)(a) After appropriate field trials or other demonstrations or studies satisfactory to the cabinet have shown that the introduced species, if proposed as the permanent vegetation, can establish an effective and permanent cover compatible with the vegetation on surrounding areas and compatible with the approved postmining land use; or

(b) The species are necessary to achieve a quick, temporary, and stabilizing cover that aids in controlling erosion; and measures to establish permanent vegetation are included in the approved plan submitted under 405 KAR 30:130.

(4) The cabinet may require the use of particular species or mixtures when such species are determined to enhance fish and wildlife resources, to be more effective in controlling erosion, to be more effective in establishing permanent vegetation or to be more effective in achieving the approved postmining land use.

Section 3. Timing. Seeding and planting of a disturbed area shall be conducted during the first normal period for favorable planting conditions after final preparation. The normal period for favorable planting shall be that planting time generally accepted locally, or as established by the cabinet, for the type of plant materials selected. When necessary to effectively control erosion, any disturbed area shall be seeded and planted, as contemporaneously as practicable, within thirty (30) days of the completion of backfilling and grading, to establish a temporary cover of small grains, grasses, or legumes until a permanent cover is established.

Section 4. Mulching and Other Soil Stabilizing Practices. (1) Suitable mulch or other soil stabilizing practices shall be used on all regraded and topsoiled areas to control erosion, to promote germination of seeds, or increase the moisture retention capacity of the soil. The cabinet may, on a case-by-case basis, suspend the requirement for mulch, if the cabinet finds that alternative procedures proposed by the permittee will achieve the requirements of Section 6 of this administrative regulation and do not cause or contribute to air or water pollution.

(2) When required by the cabinet, mulches shall be mechanically or chemically anchored to the soil surface to assure effective protection of the soil and vegetation.

(3) Annual grasses and grains may be used alone, as in situ mulch, or in conjunction with another mulch, when the cabinet determines that they will provide adequate soil erosion control and will later be replaced by perennial species approved for the postmining land use.

(4) Chemical soil stabilizers alone, or in combination with appropriate mulches, may be used in conjunction with vegetative covers approved for the postmining land use.

Section 5. Grazing. When the approved postmining land use is grazing or pasture land, the permittee may demonstrate successful revegetation by using the reclaimed land for livestock grazing at a grazing capacity approved by the cabinet approximately equal to that for similar nonmined lands, for at least the last two (2) full years of liability required under Section 6(2) of this administrative regulation, or by other appropriate demonstration approved by the cabinet. It is recommended that grazing capacity be accomplished gradually so that overgrazing does not occur and damage the vegetation cover.

Section 6. Standards for Success. (1) Success of revegetation shall be measured by techniques approved by the cabinet after consultation with appropriate state and federal agencies. Comparison of ground cover and productivity may be made on the basis of reference areas or through the use of technical guidance procedures published by USDA or other procedures approved by the cabinet for assessing ground cover and productivity. Management of the reference area, if applicable, shall be comparable to that which is required for the approved postmining land use of the permit area.

(2)(a) Ground cover and productivity of living plants on the revegetated area within the permit area shall be at least equal to the ground cover and productivity of living plants on the approved reference area, or to the standards in technical guides approved by the cabinet. Ground cover and productivity shall equal the approved standard for the last three (3) consecutive years of the responsibility period.

(b) Except as provided in subsection 2(c) of this section, the period of extended responsibility under the performance bond requirements of this administrative regulation begins at the last time of substantially augmented seeding, fertilizing, irrigation or other work necessary to ensure successful vegetation, and continues for not less than seven (7) years.

(c) The ground cover and productivity of the revegetated area shall be considered equal if they are at least ninety (90) percent of the ground cover and productivity of the reference area with ninety (90) percent statistical confidence, or with eighty (80) percent statistical confidence on shrublands, or

ground cover and productivity are at least ninety (90) percent of the standards in a technical guide approved pursuant to paragraph (a) of this subsection. Exceptions may be authorized by the cabinet under the following standards:

1. For areas to be developed for industrial or residential use within two (2) years after regrading is completed, the ground cover of living plants shall not be less than the cabinet determines to be necessary to control erosion; and

2. For areas to be used for cropland, success in revegetation of cropland shall be determined on the basis of crop production from the mined area as compared to approved reference areas or other approved technical guidance procedures. For the purposes of erosion control and for efforts to rebuild the organic content in the soils, the first two (2) years grasses and legumes will be allowed upon approval of the cabinet. Crop production from the mined area shall be equal to or greater than that of the approved standard for at least two (2) consecutive growing seasons out of the remaining five (5) year liability period established in paragraph (b) of this subsection. Production shall not be considered equal if it is less than ninety (90) percent of the production of the approved standard with ninety (90) percent statistical confidence. The applicable seven (7) year period of responsibility for revegetation shall commence at the date of initial planting of the crop being grown. Within thirty (30) days of planting, the permittee shall notify the cabinet that the initial planting of the crop has been completed. Promptly thereafter, the cabinet shall inspect the area to verify that the initial planting has been completed.

3. On areas to be developed for fish and wildlife management or forestland, success of vegetation shall be determined on the basis of tree, shrub or half-shrub stocking and ground cover. The tree, shrub, or half-shrub stocking shall meet the standards described in Section 7 of this administrative regulation. The area seeded to a ground cover shall be considered acceptable if it is at least seventy (70) percent of the ground cover of the reference areas with ninety (90) percent statistical confidence or if the ground cover is determined to be adequate to control erosion by the cabinet. This subsection shall determine the responsibility period and the frequency of ground cover measurement.

- (3) The permittee shall:

- (a) Maintain any necessary fences and proper management practices; and

- (b) Conduct periodic measurements of vegetation, soils, and water prescribed or approved by the cabinet, to identify conditions during the applicable period of liability specified in subsection (2) of this section.

- (4) For purposes of this section, herbaceous species means grasses, legumes, and nonleguminous forbs; woody plants means woody shrubs, trees, and vines; and ground cover means the area of ground covered by the combined aerial parts of vegetation and the litter that is produced naturally on-site, expressed as a percentage of the total area of measurement.

Section 7. Tree and Shrub Stocking. This section sets forth standards for revegetation of areas for which the approved postmining land use requires woody plants as the primary vegetation, to ensure that a cover of commercial tree species, noncommercial tree species, shrubs or half-shrubs, sufficient for adequate use of available growing space, is established after mining activities.

- (1) Stocking, i.e., the number of stems per unit area, will be used to determine the degree to which space is occupied by well-distributed, countable trees, shrubs or half-shrubs.

- (a) Root crown or root sprouts over one (1) foot in height shall count as one (1) toward meeting the stocking requirements. Where multiple stems occur only the tallest stem will be counted.

- (b) A countable tree or shrub means a tree that can be used in calculating the degree of stocking under the following criteria:

1. The tree or shrub shall be in place at least three (3) growing seasons;

2. The tree or shrub shall be alive and healthy; and

3. The tree or shrub shall have at least one-third (1/3) of its length in live crown.

(c) Permanent roads and surface water drainage ways on the revegetated area shall not require stocking.

(2) The following are the minimum performance standards for areas where commercial forest land is the approved postmining land use:

(a) The area shall have a minimum stocking of 450 trees or shrubs per acre.

(b) A minimum of seventy-five (75) percent of countable trees or shrubs shall be commercial trees species; and

(c) The number of trees or shrubs and the ground cover shall be determined using procedures described in Section 6(2)(c) of this administrative regulation and subsection (1) of this section of this administrative regulation, and the sampling method approved by the cabinet.

(d) Upon expiration of the seven (7) year responsibility period and at the time of request for bond release, each permittee shall provide documentation showing that the stocking of trees and shrubs and the ground cover on the revegetated area satisfy Section 6(2)(c)3 of this administrative regulation and this subsection.

(3) The following are the minimum performance standards for areas where woody plants are used for wildlife management, recreation, shelter belts, or forest uses other than commercial forest land:

(a) The stocking of trees, shrubs, half-shrubs and the ground cover established on the revegetated area shall approximate the stocking and ground cover on the reference area, or shall approximate the stocking and ground cover as approved in the mining and reclamation plan as appropriate for the approved postmining land use.

(b) Where a reference area is utilized, an inventory of trees, half-shrubs and shrubs shall be conducted on established reference areas according to methods approved by the cabinet. This inventory shall contain but not be limited to:

1. Site quality;
2. Stand size;
3. Stand condition;
4. Site and species relations;
5. Appropriate forest land utilization considerations; and
6. Species types.

(c) Upon expiration of the seven (7) year responsibility period and at the time of request for bond release, each permittee shall provide documentation showing that:

1. The woody plants established on the revegetated site are equal to or greater than ninety (90) percent of the stocking of live woody plants of the same life form on the reference area or of the life form as approved in the permittee's mining and reclamation plan, with eighty (80) percent statistical confidence; and

2. The ground cover on the revegetated area satisfies Section 6(2)(c)3 of this administrative regulation. Species diversity, seasonal variety and regenerative capacity of the vegetation of the revegetated area shall be evaluated on the basis of the results which could reasonably be expected using the revegetation methods described in the mining and reclamation plan.

**Section 8. Planting Report.** Prior to, or simultaneously with, the submittal of an application for the initial bond release on an area, the permittee shall file a certified planting report with the cabinet, on a form prescribed and furnished by the cabinet, giving the following information:

- (1) Identification of the operation;
- (2) Permit number;
- (3) The type of planting or seeding, including mixtures and amounts;
- (4) The date of planting or seeding;
- (5) Fertilizer rates or amounts and types of other soil amendments applied;

(6) The area of land planted; and

(7) Such other relevant information as the cabinet may require. (8 Ky.R. 134; Am. 490; eff. 3-1-82; TAm eff. 8-9-2007.)